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OCT 23 1930

MILBANK MEMORIAL FUND

QUARTERLY BULLETIN

NEW YORK HEALTH DEMONSTRATIONS

VOL. VIII

OCTOBER 1930

No. 4

A RURAL HEALTH EXPERIMENT IN CHINA

*Milbank Memorial Fund Aids the Development of the
Public Health Program in Ting Hsien*



FROM Cattaraugus County to Ting Hsien seems a long step to take in aiding rural health. Yet the Milbank Memorial Fund, in making a grant to the Chinese National Association of the Mass Education Movement, is now contributing to the development of an experimental public health program in a typical county in the heart of China.

The Chinese National Association of the Mass Education Movement is composed of a number of prominent Chinese leaders in education, business and social welfare. Formed in 1923 as a nationwide movement to promote adult education along the lines initiated by Y. C. James Yen, internationally known as "Jimmie" Yen, its activities were first

mainly along the lines of large scale mass education campaigns and resulted in the establishment of thousands of "People's Schools" for reducing illiteracy among adult Chinese. It is difficult to estimate the scope of this work, but it is stated by officials of the Association that approximately 5,000,000 persons have been taught by about 100,000 voluntary teachers. The Chinese written language of 40,000 word characters was simplified in such a way as to require approximately only 1,000 characters, and twelve million copies of the "Thousand Character Books" have been sold. The principles and methods of mass education developed by Dr. Yen and his associates

have been adopted by the National Government, the Young Men's Christian Association, the American Board of Missions, and other organizations, national and local.

In 1927, the Association decided that the next step, after the extensive work of the preceding years, was to engage in an intensive "qualitative" experiment. Heretofore the Association had been supported by funds contributed entirely from Chinese resources. It was realized, however, that the experi-

IMPROVING the health of 400,000 residents of a rural county in the heart of China, and the task of inaugurating modern public health procedure in a virgin territory, have been recently undertaken by the Chinese National Association of the Mass Education Movement with the financial aid of the Milbank Memorial Fund. The experiment is being conducted in Ting Hsien, where, since 1927, the Association has been engaged in a program of agricultural extension, industrial education, social surveys, and research in methods of teaching. ¶ The first article in this issue of the *Quarterly Bulletin* summarizes the present status of the demonstration, and the program which is proposed for the future.

ment—which would last at least five years—was too expensive an undertaking to be supported by the Chinese in the present unfavorable economic situation, and Dr. Yen came

to the United States to secure contributions for a five-year period. This he was able to accomplish. The experiment includes activities in public health, agricultural extension, industrial education, social surveys, research in methods of teaching and in providing a well rounded literature for the masses. The Association now has a staff of over 100 persons, many of them being American university graduates, and a number being former professors in Chinese universities, govern-

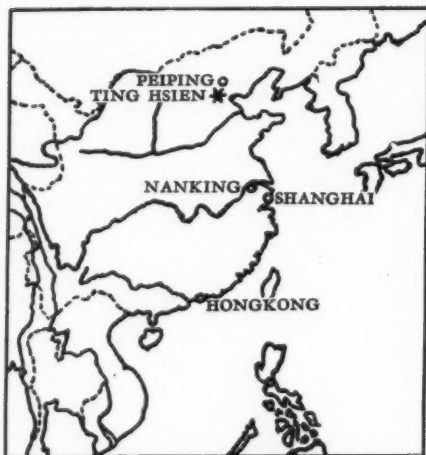
A SUMMARY of a study of the sickness records of sample groups of industrial workers, recently completed by the Fund's Division of Research, appears on page 109. This study is one of a series of studies on disease of adult life being undertaken by the Division. The results of a study of the sickness records of pupils in one school in Olean, New York, are reported on page 113. ¶ With deep regret the Fund records the death of John G. Milburn, who, since 1920, has been a member of its Board of Directors. A statement by Albert G. Milbank, president of the Fund, concerning Mr. Milburn's service on the directorate, appears in this issue.

ment officials, and leaders in various activities. Chinese leadership is a cardinal principle of the Association, and all of the staff are Chinese.

The significance of this health experiment in an interior county of China must be viewed against a background of facts that is not entirely familiar to the average American. At first glance an undertaking of such character in a period of civil war, chaotic political situation and seriously disturbed industrial conditions may seem untimely. The answer of the

Chinese leaders who contribute to and lead this movement is that now is the strategic time for a non-political organization, such as the Chinese National Association of the Mass Education Movement, to begin a genuine experiment and thus lay the foundation for more effective governmental activities when the political situation has cleared itself. The Association, it may be remarked, has steered clear of affiliation with any of the political factions but has the good will of the leaders of the different parties because of the character of its aims, work and personnel. Furthermore, while civil war exists and the outside world hears of military movements, of banditry and of the ebb and flow of political strength from one leader to another, the great mass of Chinese people are as

Outline map of China showing location of Ting Hsien.



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yet not greatly disturbed. Over 80 per cent of the population live in villages that average perhaps a thousand inhabitants each. These villages are merely clumps of farming families held together by ownership of land, common ancestry and the simplest form of democratic government. It is, in fact, more than rural—it is *of* the soil, earthy in a sense so

literal that the ordinary American can not understand unless he remembers the pioneer life of the West or is familiar with the tenant farms or mountain sections of the South. Yet,



although this has gone on without much alteration for a thousand years or so, portentous changes are inevitable. For, whatever faction controls China in the future will be vitally affected by modern points of view, imbued with the industrial, social and educational ideas of the Western world, and ready to apply Western methods in the building of a new Chinese nation. In fact, China may in time out-modern the nations of the West in certain respects.

The Ting Hsien experiment thus is regarded in China as of pioneer importance in applying modern scientific knowledge to conditions that are extraordinarily peculiar—from the Western point of view—at a time when experimentation may yield results of profound importance in the future.

Although the various new governments that have been set up in China have provided for public health in their paper schemes and actually appointed administrators, little public health has as yet been tried. In a few localities some beginnings have been made. This is notably true of Peiping (formerly Peking) where the great medical college was established by the Rockefeller Foundation. Practically nothing has been

accomplished in rural China, however. It is a virgin field for the application of modern medicine and public health. No dependable nation-wide vital statistics exist, but records of sample populations indicate an annual death rate of approximately 30 per 1,000 and an average expectation of life at birth of only about 35 years. The health problems depicted by available records of causes of death are widely different from those in

Distribution according to cause of 136,799 deaths reported in Shansi Province, China, in 1923¹.

	Number	Per cent
TOTAL	136,799	100.0
Malaria	834	.6
Cholera	2,732	2.0
Dysentery	7,691	5.6
Typhoid	11,690	8.5
Smallpox	8,203	6.0
Measles ²	21,625	15.8
Diphtheria	6,647	4.9
Tuberculosis	15,108	11.0
External causes	1,000	.7
Child birth ³	4,725	3.5
Old age	33,733	24.7
Other causes	22,811	16.7

Cattaraugus County, as shown herewith.

As to public health conditions in Ting Hsien, Dr. H. Y. Yao says:

"Over 90 per cent of the people are illiterates and most of them are poor, ignorant and superstitious, living in mud huts, blackened with soot and smoke, swamped with flies, mosquitoes, bed bugs, fleas and rats. Even the so-called middle classes keep their domestic animals in the quarters where they sleep, cook and eat. Their lives are haunted with frequent sickness and disease. The health knowledge of the people is low and the available medical facilities are nil. Modern medicine is a curiosity and public health is unheard of. In the whole county of 400,000 people there is not a single qualified modern trained physician. The old style Chinese physicians are such that they ascribe cause of diseases to heat and wind. They know nothing of infection and will deliberately thrust a needle into a man's abdomen after moistening it with their own saliva."

¹Compiled by C. M. Chiao, of the College of Agriculture, Nanking University, from the Shansi Province reports.

²In all probability includes scarlet fever.

³These constitute approximately 22 per cent of all deaths reported as occurring among females 15-44 years of age.

Ting Hsien is a fairly typical county with a population of about 400,000 living in 400 villages, situated 170 miles south of Peiping on the Peking-Hankow railroad. Dr. Yen and his associates began educational and agricultural extension work there in 1927 and in less than three years have made great progress. Agricultural stations and schools of various types and grades have been established and other activities are under way. The Hsien or county government has given its support and popular confidence appears to have been thoroughly won. In the autumn of 1929, with the financial aid of the Milbank Memorial Fund, public health work was begun. Dr. H. Y. Yao, a graduate of Peking Union Medical College, was chosen as head of the health department. Extraordinarily successful health campaigns were conducted, a small dispensary and clinics were established at the county seat, and a survey of health conditions and collection of vital statistics were begun. In the spring of 1930, vaccinations against smallpox were carried on with great success, and local health organization was further developed. Dr. Yao also devoted considerable time to a study of the health problems and the formulation of a preliminary program. In March, 1930, Edgar Sydenstricker, director of the division of research of the Milbank Memorial Fund, went to China as a technical advisor, and as the result of his conferences with Dr. Yen and Dr. Yao at Ting Hsien, and various public health experts in China, including Roger S. Greene, Professor John B. Grant of the Peking Union Medical College, Miss Anna McCabe and Dr. T. A. Li of the Peiping Health Center; Dr. Marion Yang, director of the National Midwifery School, and Dr. J. Heng Liu, National Minister of Health, a provisional program of activities for 1930 and 1931 was drawn up. Later this program was approved by the directors of the Chinese National Association.

Briefly summarized, the program proposes a gradual extension of the public health activities already begun in connection with the other activities of the Mass Education Movement in Ting Hsien, in the following ways:

1. By selecting certain specific health problems for initial attack. Provisionally these problems will include—

Specific diseases and conditions—smallpox, trachoma, tetanus, neonatorum and gastro-intestinal diseases (chiefly typhoid and dysentery), and the relief of the more common and simple ailments in the general population.

These activities can be developed, it is believed, into more extensive attacks upon problems of maternity and infancy, and health of school children, as adequate local personnel are trained.

Health education (a) in normal schools, especially for Mass Education teachers, (b) for public primary teachers, (c) in Mass Education ("people's") schools, (d) for the public, et cetera.

Medical and clinical services in the population groups among whom health activities are carried on. It is proposed that this care be commenced by providing limited facilities for hospitalization of cases not involving serious major operations or chronic conditions, but including maternity cases; general clinics in Ting Hsien City and traveling clinics in villages; special clinics as the opportunity arises in Ting Hsien City and in villages.

Research of a practical kind into methods of purification of water supplies and protection of foods on sale; disinfection of human feces used for fertilizing purposes; production of supplementary foods, such as soy bean milk, in collaboration with agricultural extension work.

Methods of birth and death registration and notification of certain communicable diseases.



The initial health staff in Ting Hsien. From right to left: H. Y. Yao, M.D., health officer; Miss S. L. Kao, supervising public health nurse; C. A. Ma, clinical aide.

2. By enlarging the existing administrative and supervisory health staff to include a medical director (or health officer), an assistant health officer to supervise sanitation work and vital statistics, a public health nurse to supervise other nurses and visiting aides, a woman physician to supervise infant, maternity and preschool activities and midwives, an educational director to supervise public health education work in all of the activities in Ting Hsien, a laboratory technician, a pharmacist and a secretary or administrative assistant.

To these should, of course, be added the necessary staff for the infirmary (see below), including a competent physician, clinical aides, nurses and attendants. The relief activities would be carried on also by the other medical and nursing personnel on the supervisory staff.

3. By providing for the training of local subordinate and

field personnel which, provisionally, would include (a) sanitary inspectors; (b) visiting aides for public health nursing work; (c) midwives. In addition, it is proposed to afford training in first aid and the use of a few medicines to certain individuals, such as public and "people's" school teachers, village elders and others, and some simple instruction of practising midwives to lessen tetanus and other infections.

4. By constructing a health center in Ting Hsien City which would serve as the point of radiation of the various activities. This center would provide:

- (1) Headquarters for the administrative and supervisory staff.
- (2) A small infirmary with 25 beds so arranged as to provide for small wards for men and for women, maternity cases and a nursery, and the necessary quarters for assistant nurses and serving staff.
- (3) A pharmacy.
- (4) A small public health laboratory.
- (5) An outpatient department with waiting room (to be used also as lecture hall for exhibits), medical examination rooms, et cetera.
- (6) A lecture room, to be used also as study hall and library for persons in training.

The provision for an experimental central health center for a rural area is regarded as of primary importance in view of the necessity for medical and clinical facilities and for facilities for practical training of local personnel.

5. By gradual extension of clinical and health activities within Ting Hsien City and into the nearby villages. It is proposed to consider the area surrounding Ting Hsien City as the "health demonstration" or "health experimentation" area. This area includes about one-sixth of the entire Hsien, has a radius of about four miles and a population of about

80,000 in seventy-two villages. For the immediate future, however, it is proposed to begin with a group of three or four villages in the southeast section of this area and gradually to extend activities to the entire southeast section which includes twenty-four villages. The rapidity of this extension will depend upon the supply of local personnel, development of methods and popular support.

6. By continuing, in cooperation with the Survey Department of the Mass Education Movement, general economic, social and health surveys of the population, and making special surveys of sanitary and other conditions of the specific villages in which clinic and health activities are to be begun.

An outstanding feature of the rural health program in this interior Chinese county is the necessity for providing medical and nursing service as well as preventive activities. In fact, the entire program may be characterized as experimental, within strict limits of economy, in order that its results can be put into practice by the Chinese themselves.





***RURAL** China is a virgin field for the application of modern medicine and public health.*

THE EXTENT OF DISABLING SICKNESS AMONG WAGE-EARNING ADULTS

*A summary of some results from one of a series of studies
on diseases of adult life, made by the Division of
Research of the Milbank Memorial Fund*



KNOWLEDGE of the health status of industrial workers in general, and of certain occupations in particular, up to a decade or so ago in the United States was based largely on mortality statistics. Such information, however, has always been very scanty in this country, because we do not have national mortality statistics according to occupation such as those published decennially by the Registrar General of England and Wales. For only two years, 1908 and 1909, has the Federal Census Bureau published the number of deaths according to occupation. In the realization that information concerning the health of workers in industry was urgently needed, a group of vital statisticians and industrial hygienists attempted some ten years or more ago to obtain records of *sickness* among industrial workers which would afford knowledge of the amount and nature of disabling illness in sample groups of the industrial population, and especially of groups exposed to specific health hazards, such as those in certain dusty trades.

With the cooperation of the United States Public Health Service, a review¹ of some of the industrial morbidity data that have been collected and analyzed in recent years, has been recently completed by Dean K. Brundage for the Division of Research of the Milbank Memorial Fund.

The morbidity statistics utilized are based on records of absences from work on account of disability among persons

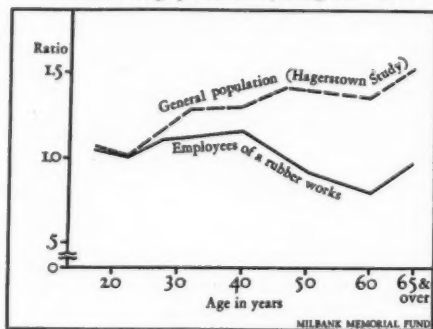
¹The complete study will be published in the November and December issues of the *Journal of Industrial Hygiene*.

on the payroll of industrial establishments or belonging to industrial sick-benefit associations. Causes of absence from work were ascertained by visiting nurses or others who called at the homes of absent employees, while the records of mutual benefit associations were of claims for sickness benefits, usually of illnesses causing absence for more than one week, which were accepted and paid after investigation by administrators of the sick-benefit funds.

The sickness statistics of industry represent to a surprising extent the younger adult ages. In the manufacturing industries of the country as a whole, probably 80 per cent of the men are below age 45. This estimate is based on the age distribution of 10,143 men representing ten important industries. A larger proportion of the female industrial workers, apparently from 90 to 95 per cent, is below age 45.

There is evidence in the age curves of illness that industrial

Fig. 1. A comparison of the variations in sickness according to age in a general population group and among a group of industrial employees. The variations are relative, the rate for the age period 20-24 being taken as 1.



workers are not representative of the general population from a physical standpoint. Rather, they appear to be, in the main, the flower of the general population in physique and constitution. Between 15 and 50, the age curve of illness in a general population group was found to

mount more rapidly than in a typical industrial group, as shown in the accompanying figure. (Fig. 1) In the graph the sickness incidence rate for the age period 20-24 is taken as

1.0 in both industrial and general population groups in order to facilitate comparison of the trend in the age curves of illness. In the general population the trend is seen to be steadily upward from ages 20-24 on; but among the industrial employees the frequency rates (based on disabilities lasting two working days or longer) rose more slowly from age 25 to 40, and then actually declined up to about age 60 after which the upward trend in the frequency of disability was resumed.

The failure of illness frequency to increase with age as rapidly among industrially employed persons as among those in the general population *suggests* that the healthier individuals may tend to remain in industry to a greater extent than the sickly.

Some of the more interesting findings discussed in the longer report are presented in the following summary:

1. During the eight years from 1921 to 1928, inclusive, respiratory diseases caused nearly one-half of all the disabilities on account of sickness. The second most important *group* of diseases from the standpoint of sickness frequency was the digestive disease group. The contagious and infectious diseases against which public health effort is often so largely concentrated caused only about three per cent of the cases.

2. Among industrial workers disabilities lasting more than one week apparently do not increase markedly with age prior to about age 50. The number of days lost per person tends to increase more rapidly with age than the frequency of illness. The duration of incapacitation increases considerably as age advances.

3. Female industrial workers tend to be absent on account of illness from 50 to 100 per cent oftener than the males, the widest disparity in the rates of the two sexes being for the shorter sicknesses. Considerable difference appears to exist in

the relative susceptibility of the two sexes to certain diseases.

4. Immigrant workers from the warm regions of southern Europe appear to be more liable to attack from certain respiratory diseases than persons from northern and central Europe or those native to this country.

5. Married women on the factory payroll of a large rubber company experienced considerably more disability than the single women.

6. In two studies made by the Public Health Service, the excessive use of alcoholic stimulants was found to be most pronounced among the men doing the heaviest, most disagreeable work.

7. A process of selection appears to be going on in certain industries through the quitting of those less well adapted physically to the nature of the work and the working conditions to which they were exposed. Those who tend to remain indefinitely in an industry, especially if it involves some hazard to health, represent a favorably selected group from a health standpoint.

8. Studies of disabling sickness among the employees of different industries indicate a high rate of sickness, and especially of respiratory diseases, among gold miners in the Black Hills, granite cutters in Barre, Vermont, several groups of coal miners, and among employees of a dusty cement plant. A high rate of pneumonia was found among men in certain departments of the iron and steel industry. A surprising result was the definiteness of the excess in the incidence of influenza in all four of the above-mentioned dusty trades.

Mr. Brundage's study of the actual occurrence of illness among American industrial workers thus points definitely to problems still unsolved by preventive medicine and public health. The average community so far has failed to be conscious of their existence.

SICKNESS RECORDS IN SCHOOL HYGIENE

*A summary of a study made by the Division of
Research of the Milbank Memorial Fund¹*



THE adequacy of the school medical examination, even in its more highly developed form, as a means of checking the school child's health, properly is being called into question. The principal ground for skepticism is the obvious fact that the periodic health examination takes into account only a few conditions at intervals of two or three years; it can not promptly bring to light any of these conditions as they arise nor can it call attention to changes in the interim. Furthermore, the health examination does not and can not, unless it is made far more searching than it is now, bring to light other impairments and defects, and it can not conform to a fundamental postulate for accurate diagnosis, namely, the opportunity for continuous observation.

It may as well be taken for granted that practical considerations preclude an ideal method of continuous examination and observation of millions of children. What the school health administration wants is improvement in the prevailing procedure that will result in the prompter discovery and correction or treatment of important conditions that now are not brought to light at all or with too much delay.

One method of supplementing the medical examination is a current record of absence from school on account of sickness. The present report is based on the sickness record of two school years and medical examinations in one graded school in Olean, New York.² A total of 475 pupils were enrolled

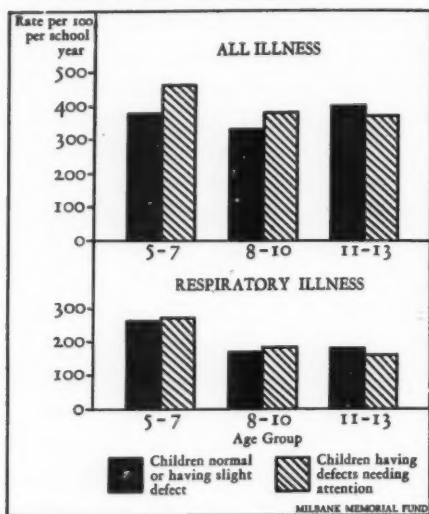
¹The study will be published in the November issue of the *American Journal of Public Health*.

²These records were made available through the cooperation and interest of Dr. C. A. Greenleaf, Director of School Hygiene, Cattaraugus County.

during these two years, but only those pupils who were in attendance one or two full school years were included in the record utilized in this report.

In order to ascertain the extent to which defects and impairments in general are adequate indications of ill health manifested in actual sickness, the children in this school were divided into two categories: (1) Those found upon physical examination to be normal or to have a slight abnormality (1x); (2) Those having any defective condition serious enough to warrant notification of the parents that the condition needs attention (2x and 3x). The accompanying graph

Fig. 1. Absences because of all illnesses and respiratory illness by age groups in one school in Olean, New York, 1926-1928.



(Fig. 1) shows the comparison by age groups. The illness rate was found to vary according to age, as expected, but evidence that it was higher among children with gross defects than among those who were free from them was by no means definite. It may be argued that this lack of association may have been due to inadequate examinations; but our observation was that the physical

examinations in this school, which were made by the director of the school health service, were done with more care than is ordinarily found in routine work of this kind.

This comparison was carried a step further by comparing the prevalence of specific defects among 221 children suffering less than the average number of sicknesses and among 176 children who were sick frequently (five attacks or more per year). This is shown in the accompanying table.

The striking fact shown by this comparison is not that the defect rates were generally somewhat higher in the "sickly" group, but that relatively a small proportion of 176 children who were actually sick five or more times during a school year were discovered to have any *serious* defects upon physical examination. In other words, the findings of the physical examination, even when considered from the point of view of specific and serious conditions, are a poor indication of the extent to which the child is actually sick.

Certain defects were considered which may be reflected directly in sickness of the same specific nature, such as diseased tonsils and tonsillitis, and carious teeth and toothache. By including children who had special nose and throat examinations in addition to the regular physical examina-

Prevalence of serious defects among children sick less than the average and among children frequently sick in a school in Olean, New York, 1926-1928.

DEFECT	PER CENT OF CHILDREN WITH OR WITHOUT SPECIFIC DEFECT			
	221 children having less than 3 illnesses per school year		176 children having 5 or more illnesses per school year	
	Normal or slight defect	Defect needing attention	Normal or slight defect	Defect needing attention
Tonsils	84.1	15.9	76.7	23.3
Glands	100.0	0	99.4	.6
Nervous system	98.2	1.8	97.8	1.2
Heart	98.6	1.4	99.4	.6
Lungs	100.0	0	99.4	.6
Ears	100.0	0	99.4	.6
Eyes	92.8	7.2	89.2	10.8
Temporary teeth	91.4	8.6	89.2	10.8
Permanent teeth	80.1	19.9	72.7	27.3
Orthopedic	99.1	.9	99.4	.6
Thyroid	99.5	.5	97.7	2.3

tion, there was a total of 767 children observed for one year. Relating the sickness record to the same school year in which the examination was made, the children were classified into two groups: those with "normal" or "1x" tonsils and those with "2x" or "3x" tonsils. In the latter group there were 163 children, all of whom presumably were referred for correction. Of the 604 children with "normal" or "1x" tonsils, 59 actually suffered one or more attacks of tonsillitis or sore throat. Six of them had attacks in each of the two school years. A considerable number of these, if not all, probably should be considered as needing examination and attention. Similarly, 177 children were found upon examination to have teeth needing attention, but of the 413 children whose teeth were in satisfactory condition when the examination was made, 73 actually suffered one or more toothaches that resulted in absence from school.

Summarizing the results of the experiment, it appears true that the proposals of the American Public Health Association Committee on Record Forms to utilize sickness records as a means of discovering conditions in school children that may need treatment or correction, is a sound one in principle. A current record of sickness, if specific enough as to cause, undoubtedly reveals many conditions which the medical examination does not bring to light.



JOHN GEORGE MILBURN

December 13, 1851—August 11, 1930

AFTER a long and distinguished professional career and a life of public service, John G. Milburn died in August of this year. Mr. Milburn was born in Sunderland, England, in 1851. He was educated in England and came to America at the age of nineteen. He began his professional career as a reader of law in Batavia, New York. He was admitted to the American Bar in 1874, and by 1904, when he came to New York City from Buffalo, he had already established himself as one of the foremost lawyers of this State. At the time of his death he was a member of the law firm of Carter, Ledyard and Milburn.

He was twice president of the New York State Bar Association, and president of the Association of the Bar of the City of New York. Harvard, Princeton, and Alfred Universities conferred the honorary degree of Doctor of Laws upon him.

He was a trustee of Columbia University and of the New York Public Library, and chairman of the Board of Barnard College. He was also a member of the Board of Directors of the Chase National Bank, and a director and member of the executive committee of the American Express Company. Since 1920, Mr. Milburn had been a member of the Board of Directors of the Milbank Memorial Fund.

Albert G. Milbank, president of the Fund, on learning of Mr. Milburn's death, made the following statement concerning his membership on the Fund's Board of Directors:

In the death of John G. Milburn on August eleventh, nineteen hundred and thirty, the Milbank Memorial Fund lost a wise and devoted counsellor and his fellow directors a well-beloved friend.

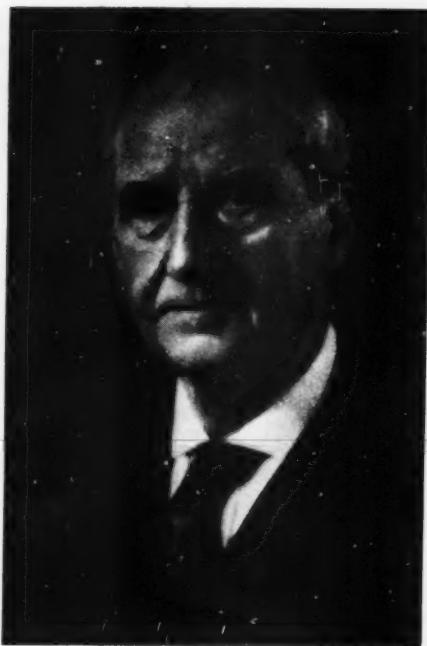
Mr. Milburn was one of that small group of distinguished

men who upon the invitation of Mrs. Anderson, the founder of the Fund, joined the Board of Directors in the month of December, 1920.

It was at a time when Mrs. Anderson, with a clear understanding that her own life was drawing to a close, devoted much thought to the future conduct of the Fund and to the development of policies and measures that would promote human welfare and happiness.

Mr. Milburn joined the Board with a

deep and sympathetic interest in the aims and purposes of the Fund. In fulfilling the duties of his office he placed freely at the disposal of the Fund those rare qualities of mind and heart that made him a leader in the many and varied phases of life which claimed his interest. He was always considerate of the feelings and opinions of others, yet he never lacked in courage to act in accordance with his own convictions. His approach to the study and solution of a problem was thoughtful and serious and yet he seldom left the subject untouched by that whimsical humor that made him such a delightful companion.



FACH BROTHERS

JOHN GEORGE MILBURN
December 13, 1851—August 11, 1930



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* Died August 11, 1930.

